

EXHIBIT 4

3.4 Cultural Resources

The term *cultural resources* refers to the broad range of resources that represent or convey a place's heritage or help tell the story of a region's past. These resources are considered important to a community and worth preserving. A cultural resource can be any building, structure, object, site, landscape, or district associated with human manipulation of the environment. These resources are often valued (monetarily, aesthetically, or religiously) by a particular group of people and can be historic in character or date to the prehistoric past (i.e., prior to written records).

Three categories of cultural resources are discussed in this section: archaeological resources, historical resources, and culturally significant properties. Archaeological resources encompass features and deposits located on or below the ground surface that are evidence of prior human occupation or use in a particular area. Historical resources are elements of the built environment, such as buildings or structures, or human-made objects or landscapes. Finally, culturally significant properties are sites or locations considered culturally important to the history of a group of people, or are locations where culturally important events or practices are known to have occurred. In contrast, tribal resources refers to the collective rights and resources associated with a tribe's sovereignty and/or formal treaty rights. Tribal resources are addressed in Section 3.5, *Tribal Resources*.

This section describes cultural resources in the study area. It then describes impacts on cultural resources that could result from construction and operation of the Proposed Action and under the No-Action Alternative. This section also presents the measures identified to mitigate impacts resulting from the Proposed Action and any remaining unavoidable and significant adverse impacts.

The analyses and findings from this section are based on research prepared by the Applicant pursuant to Section 106 of the National Historic Preservation Act of 1966 (NHPA) (Section 106). The U.S. Army Corps of Engineers (Corps) is carrying out the Section 106 review concurrent to the Proposed Action's compliance with the Washington State Environmental Policy Act (SEPA) and National Environmental Policy Act (NEPA). As a result, cultural resources studies prepared for the Proposed Action are being used to support each of these review processes and the SEPA process will reflect the outcomes of the Section 106 and NEPA reviews, as they are available.

3.4.1 Regulatory Setting

Laws and regulations relevant to cultural resources are summarized in Table 3.4-1.

Table 3.4-1. Regulations, Statutes, and Guidelines for Cultural Resources

Regulation, Statute, Guideline	Description
Federal	
National Register of Historic Places (54 USC 3021)	The NRHP is the official list of the nation's historic places worthy of preservation and is administered by the National Park Service as part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historical and archaeological resources.
National Historic Preservation Act, Protection of Historic Properties (54 USC 300101) (36 CFR 800)	Stipulates the protection of historic properties and outlines the Section 106 process of the NHPA.
Archaeological Resources Protection Act (16 USC 470aa)	Provides for the protection of archaeological resources and sites on public lands and Indian lands, and seeks to foster cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals.
Native American Graves Protection and Repatriation Act (25 USC 3001)	Describes the rights of Native American descendants, Indian tribes, and Native Hawaiian organizations with respect to the treatment, repatriation, and disposition of Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony.
American Indian Religious Freedom Act (42 USC 1996)	Protects and preserves the traditional religious rights and cultural practices of American Indians, Eskimos, Aleuts, and Native Hawaiians.
State	
Indian Graves and Records (RCW 27.44)	Protects Native American graves and burial grounds, encourages voluntary reporting of said sites when they are discovered, and mandates a penalty for disturbance or desecration of such sites.
Archaeological Sites and Resources (RCW 27.53)	Governs the protection and preservation of archaeological sites and resources and establishes DAHP as the administering agency for these regulations.
Abandoned and Historic Cemeteries and Historic Graves (RCW 68.60)	Protects and preserves abandoned and historic cemeteries and historic graves.
Shoreline Management Act (RCW 90.58)	Provides a statewide framework for managing, accessing, and protecting the Washington's significant shorelines including rivers, lakes, and coastal waters, including the consideration of significant cultural resources in these areas.

Regulation, Statute, Guideline	Description
Local	
Historic Preservation Ordinance of Cowlitz County (CCC 18.80)	Provides for the identification, evaluation, designation, and protection of designated historic and prehistoric resources within Cowlitz County. Maintains a local register of historic places.
Longview Historic Preservation Ordinance (LMC 16.12)	Safeguards the heritage of the City of Longview by the identification, evaluation, designation, and protection of historic properties. Maintains a local register of historic places in each jurisdiction.
Notes: USC = United States Code; NRHP = National Register of Historic Places; RCW = Revised Code of Washington; DAHP = Washington State Department of Archaeology and Historic Preservation; LMC = Longview Municipal Code; NHPA = National Historic Preservation Act; CCC = Cowlitz County Code	

3.4.2 Study Area

The study area for cultural resources consists of the project area, the areas of the Columbia River that would be directly affected by overwater structures and dredging, and surrounding areas that would be affected by the construction of the Proposed Action (Figure 3.4-1). The study area also includes vantage points on the Oregon side of the Columbia River along U.S. Route 30 (US 30) to account for potential visual effects.

3.4.3 Methods

This section describes the sources of information and methods used to evaluate the potential impacts on cultural resources associated with the construction and operation of the Proposed Action and No-Action Alternative. This section also addresses how Cowlitz County and the Corps have initiated consultation with the Washington State Department of Archaeology and Historic Preservation (DAHP), City of Longview, Bonneville Power Administration (BPA), National Park Service, potentially affected Native American tribes, and the Applicant regarding the Proposed Action and potential impacts on cultural resources.

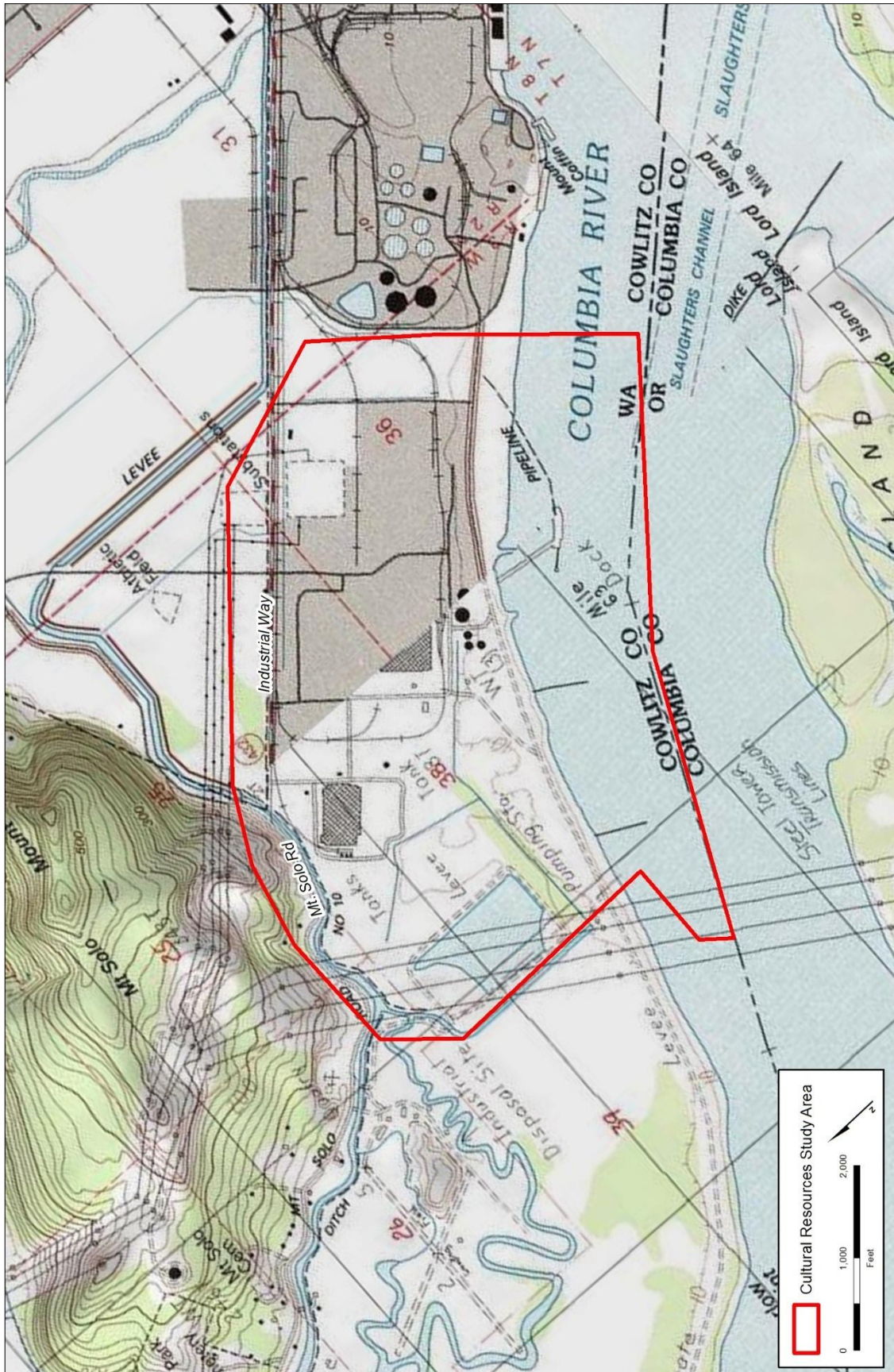
3.4.3.1 Information Sources

The following sources of information were used to identify the potential impacts of the Proposed Action and No-Action Alternative on cultural resources in the study area.

Data Sources

A literature review and records search was conducted to establish prehistoric and historic contexts and to identify previously recorded cultural resources in the study area.

Figure 3.4-1. Cultural Resources Study Area—U.S. Geological Survey Map



These efforts used the following sources of information.

- A search of DAHP's Washington Information System for Architectural and Archaeological Records Database (WISAARD) for previously completed cultural resources studies and previously documented archaeological, ethnographic, and historical resources within a 1-mile radius of the project area. An initial DAHP file search was conducted in November 2011. Updated searches of data at DAHP were completed in November 2013 and again in November 2014.
- Primary and secondary resources from local repositories, including the Cowlitz County Historical Museum.
- Historic maps, including General Land Office plat maps and topographic quadrangle maps from the U.S. Geological Survey (USGS).
- Geological and historical documents and prior geotechnical studies that characterize the local geology and landform development history.
- Aerial photographs from the 1960s obtained from the Applicant and additional aerial photographs from the Cowlitz County Historical Museum.
- Interviews with former employees of the former Reynolds Metal Company facility (Reynolds facility), currently employed by the Applicant, conducted in November 2014.
- Outreach efforts and consultation with affected tribes.

Information for this section was also extracted from the following technical reports. These documents contain confidential historic and archaeological information and access to this information is restricted by the National Historic Preservation Act of 1966, as amended, and the Archaeological Resources Protection Act of 1979, as amended. These documents are only available to agencies with jurisdiction.

- *Identification of Historic Properties: Existing Information and Proposed Research, Millennium Coal Export Terminal, Cowlitz County, Washington—June 19, 2015* (AECOM 2015)
- *Identification of Historic Properties: Existing Information and Proposed Research, Millennium Coal Export Terminal, Cowlitz County, Washington—August 18, 2015* (AECOM 2015)
- *Historic and Cultural Resources Assessment, Millennium Coal Export Terminal, Cowlitz County, Washington—October 1, 2015* (AECOM 2015)

Fieldwork

Field investigations were conducted between 2011 and 2015 to identify cultural resources in the study area. These investigations considered the archaeological and historical resources and the landform development of the project area.

- Windshield survey and walkthrough of the study area in November 2011 to assess existing conditions.
- Historic resource surveys conducted in April 2014 and January 2015 to prepare a historic property inventory of resources associated with the former Reynolds facility, which is part of the Applicant's leased area. The architectural inventory included photographic documentation, resource descriptions, and statements of significance for buildings, structures, and landscape

features. Individual resources were recorded on Washington Historic Property Inventory forms in WISAARD. In addition, a nomination form for the National Register of Historic Places (NRHP) was prepared for the former Reynolds facility for evaluation as a historic district.

- Pedestrian survey of the study area in January 2015, to document landscape features associated with the former Reynolds facility such as several former landfills and surface impoundments. These features were documented as individual resources on Washington Archaeological Site forms, per guidance from DAHP and the Corps. Building foundations associated with the South Plant portion of the former Reynolds facility were likewise documented as an archaeological site, consistent with protocols established through consultation with DAHP and the Corps.
- Geotechnical investigations of upland soils in the project area using two sampling methods: geoprobe¹ and mud rotary coring. Geoprobe sampling was used to recover 21 intact, sediment cores to anticipated maximum depths of 25 feet (the maximum depth of the Proposed Action's anticipated compression effects). A maximum total volume of 1.23 cubic feet was recovered from each geoprobe sample. Seven geotechnical borings were drilled to a minimum depth of 70 feet (the maximum depth of proposed support piles). The 70-foot cores were drilled using a mud rotary method and sediment samples were obtained using split-spoon samplers and Shelby tubes. A maximum total soil volume of 2.03 cubic foot was recovered from each geotechnical boring. Soil samples were collected from two cores for radiocarbon dating and from three cores for tephra² identification. These efforts helped determine the chronology of the landform creation in the project area and the area's potential to contain archaeological resources.

Research Design

Research and field data described above were collected, compiled, and analyzed by qualified cultural resources professionals. A research design for the identification and evaluation of cultural resources was prepared for the Proposed Action in June 2015 (McDaniel et al. 2015 cited in AECOM 2015). This document provided the following information used to refine identification of resources.

- A definition of the affected environment.
- A photographic inventory of former buildings at the South Plant portion of the former Reynolds facility.
- An archaeological work plan.
- An analysis of potential impacts on shorelines caused by increases in marine vessel traffic.
- A comprehensive study of historical channel migration at the study area. The latter addressed the potential for cultural resources to be present in the proposed in-water dredge prism (the extent of the area to be dredged).

3.4.3.2 Impacts Analysis

The following methods were used to identify and evaluate the potential impacts of the Proposed Action and No-Action Alternative on cultural resources.

¹ A geoprobe is a tubular tool driven into the ground to sample soil.

² Tephra is fragmental material produced by a volcanic eruption.

The shoreline analysis included a desktop review of information sources and the development of a geographic information system (GIS) model. The GIS model helped identify previously documented archaeological sites as the most at risk for shoreline erosion. These sites were then inspected at a reconnaissance level. The historical channel analysis included an assessment of historical bathymetric and channel migration data to address in-water conditions in the study area and the potential for eroded cultural materials to be present in the proposed dredging prism.

Historic Resources

For historic resources, buildings and structures at least 45 years old in the study area were evaluated to determine their eligibility for listing in the NRHP and the Washington Heritage Register (WHR). An NRHP nomination form was prepared for the former Reynolds facility, so the many elements of the property could be evaluated as a possible historic district. The nomination form comprehensively accounted for all buildings, structures, and landscape features situated on the former Reynolds facility.

Archaeological Resources

For archaeological resources, field investigators were precluded from using traditional methods of subsurface archaeological investigation, such as exploratory shovel probing or trenching, due to existing development and the depths of fill materials within the study area. Instead, prior geotechnical studies and over 100 previous geotechnical bore logs were reviewed to address the extent of fill within the study area and the potential existence of buried archaeological remains (Anchor QEA 2011; GRI 2012, both cited in AECOM 2015). These data were used to help guide the placement of additional deep test borings (Bundy 2010; Anchor QEA 2012, both cited in AECOM 2015), as described in Section 3.4.3.1, *Information Sources, Fieldwork*. The prior studies and the soil samples indicated a potential for direct impacts on cultural resources in the study area. Impacts were determined by evaluating if construction and operations would alter any characteristic of a cultural resource that qualifies the resource for inclusion in the NRHP or the WHR, or affect a recorded archaeological site.

3.4.3.3 Agency and Tribal Consultation

The Corps has initiated consultation with Cowlitz County, DAHP, the City of Longview, BPA, National Park Service, potentially affected Native American tribes, and the Applicant regarding the Proposed Action and potential impacts on cultural resources. In addition, the Corps has conducted a review of what it defines as the Proposed Action in compliance with Section 106 of the NHPA. The Corps is currently consulting under Section 106. The Corps expects a Memorandum of Agreement will be signed by the Corps and consulting parties and will stipulate measures to help mitigate the Proposed Action's impacts on cultural resources in the study area.

3.4.4 Existing Conditions

This section describes the existing environmental conditions in the study area related to cultural resources that could be affected by the construction and operation of the Proposed Action and the No-Action Alternative.

3.4.4.1 Setting

This section provides the context and setting for cultural resources in the study area.

Precontact Context

Studies of the archaeology and prehistory of the Pacific Northwest divide the prehistory of the region into multiple phases or periods from about 6,000 years Before the Common Era (BCE) to the 1850s. These periods are delineated by changes in regional patterns of land use, subsistence, and tool types over time. These periods are academic constructs and do not necessarily reflect Native American viewpoints. A generally accepted cultural sequence for the prehistory of the lower Columbia River region consists of four periods (Minor 1983 cited in AECOM 2015). These periods include the Youngs River complex (6000 to 4000 years BCE), the Seal Island phase (4000 BCE to the Common Era [CE] 0), the Ilwaco phase (CE 0 to 1775), and the Ethnographic period (CE 1775 to 1851).

The Youngs River complex corresponds to the end of the Archaic period. It is defined by sites with lanceolate and shouldered-lanceolate points, stemmed scrapers, and bola stones (Pettigrew 1990 cited in AECOM 2015). The later Seal Island phase is characterized by broad-necked stemmed points, cobble flake tools, harpoon darts, adzes, netsinkers, and atlatl weights, as well as the emergence of large shell middens along the coast. Intensive fishing activities are indicated by these material items. During the Ilwaco phase, a generally more diverse artifact assemblage emerged, indicative of bow and arrow technology and the use of composite toggling harpoons, and permanent villages with large houses were present. The Ethnographic period is distinguished from the earlier Ilwaco phase by the introduction of nonaboriginal artifacts and an increase in exotic personal items including shell, glass, and copper beads.

Ethnographic Context

The study area falls within the territory principally used by two groups. The Cathlamet, an Upper Chinookan-speaking people, resided along the Columbia River, east of the Lower Chinook and west of the Multnomah groups. The Cowlitz, a Salish-speaking group, resided in the Cowlitz River drainage from its mouth to below Mayfield Dam, along segments of the Toutle, Newaukum, and South Fork of the Chehalis Rivers (Curtis 1913; Hajda 1990; Silverstein 1990, all cited in AECOM 2015). During the early 19th century, the Skilloot, a subset of the Chinookan Cathlamet, resided along both sides of the Columbia River near the study area (Lewis 2013 cited in AECOM 2015). These peoples were prolific traders who transported goods between coastal groups and interior tribes (Kinkade 1997; Thorsgard et al. 2013 cited in AECOM 2015).

Native groups subsisted primarily on salmon and supplemented their diet with seasonal plant and animal resources, including berries, camas, wapato, deer, elk, bear, and waterfowl. Tribes seasonally fished and gathered roots along the Longview waterfront (Nisbet 2003:127 cited in AECOM 2015) and fishing camps were temporarily inhabited along the Columbia River (Minor 1983:72–73 cited in AECOM 2015). Houses and longhouses constructed from cedar planks were built along the Columbia River and its tributaries. Funeral customs along the lower Columbia River included the placement of the deceased in canoes elevated on trees or posts (Boyd 2013:196 cited in AECOM 2015). Graveyards were commonly located on islands or plots located near the river (Ray 1938:75 cited in AECOM 2015).

One such burial location in the vicinity of the study area was Mount Coffin. Called *Yee-eh-mas-tee*, Mount Coffin was a 240-foot-high knoll composed of volcanic rock situated on the north bank of the Columbia River approximately 0.7 mile southeast of the project area (Thorsgard et al. 2013; Moulton 1990:29-30). The site is commonly confused with Coffin Rock, a physically similar landform located about 7 miles upriver. Mount Coffin was a prominent navigational feature on the Columbia River and even more significant as a distinctive burial site, which remains important to Native American tribes in the region. Beginning circa 1906 and continuing through the 1950s, quarrying of Mount Coffin's volcanic rock gradually reduced the landform in size until it was removed.

Contact with European Americans prompted rapid change to traditional life among Native Americans. Disease devastated native populations and large groups of European-American settlers and homesteaders entering the region supplanted the local indigenous communities. The U.S. government entered into treaties with local Native Americans during the 1850s. Chinookan Cathlamet peoples, including the Skilloot, were signatories to a treaty that ceded their lands in 1851. Along with several other Lower and Middle Chinook groups, many eventually relocated to the Grand Ronde Reservation (Lewis 2013; Ruby and Brown 1992:12, 25, 208, both cited in AECOM 2015). Nonreservation Cathlamets combined with other tribes into the Chinook Nation in 1951 to file a claim with the Indian Claims Commission; the Chinook Nation continues to apply for federal recognition (Fisher and Jette 2013; Ruby and Brown 1992:2, both cited in AECOM 2015). The Cowlitz Tribe attended the Chehalis River Treaty Council in 1855 but did not sign a treaty because a reservation in their territory was not offered (Ruby and Brown 1992:70-71 cited in AECOM 2015). Some removed to the Chehalis Reservation after 1864, and others continued to reside in the Longview area (Weber, Denni, and Maxey 2012:25 cited in AECOM 2015). Local Cowlitz maintained an independent organization that became federally recognized as an Indian tribal government in 2000 (Hajda 1990:514–515 cited in AECOM 2015).

Historic Context

The first nonnative group to visit the region was a 1792 British expedition led by Lieutenant Broughton under the command of George Vancouver. This group explored the Columbia River from its mouth to the Sandy River (Mockford 2005:552 cited in AECOM 2015). Other later explorers included Hudson's Bay Company fur traders and members of the 1805–1806 Lewis and Clark expedition (Nisbet 2003 cited in AECOM 2015). Intensive settlement of the territory by European Americans began following passage of the Donation Land Act of 1850. During this period, Oregon Trail emigrants settled along the Columbia River near what later became the City of Longview. These early pioneers established the communities of Monticello (or Mount Solo) on the present site of Longview in 1850, the town of Mount Coffin (named after the prominent landform on the Columbia River; later renamed LaDu), and a settlement near what is now Barlow Point.

The property in the study area was eventually acquired and developed for industrial uses beginning in the early 20th century. The Star Sand and Gravel Company of Portland began quarrying rock from Mount Coffin east of the study area in 1906 and the Long-Bell Lumber Company established a large lumber mill in this same area in the 1920s. North of the study area, the Long-Bell Lumber Company also established the town of Longview as a planned community to support its operations. Considered the world's largest mill at the time, construction of the 2,000-acre mill changed the character of the Columbia River waterway by replacing its agricultural farms with a new industrial setting (Ramsey 1978:169-171, 196 cited in AECOM 2015).

As part of this construction, the Long-Bell Lumber Company built 15 miles of levee to protect its operations from flooding (McClary 2008 cited in AECOM 2015). Settlers had previously constructed dikes to protect the Columbia River's low-lying valley lands as early as the 1890s. In 1894, a record-setting flood led to the passage of legislation enabling the formation of diking and drainage districts. Diking District No.1 was created in 1911 to minimize seasonal and event-level floods and was the first flood management district in Cowlitz County (Erlich 2008:10-11 cited in AECOM 2015). The district constructed a levee near the study area in 1913 (Wilt 1972 cited in AECOM 2015).

Rapidly increasing industrial, commercial, and residential growth generated the need for a uniform stormwater management and flood-protection program in the early 1920s. As a result, six diking districts were combined to form the Consolidated Diking Improvement District (CDID) #1 in 1923. The Long-Bell Lumber Company worked with CDID #1 to enlarge and expand the area's existing system of dikes to protect the company's mill and town sites (Erlich 2008:11; McClelland 1976:20 both cited in AECOM 2015). CDID #1 and the Corps raised the levees in 1949 with additional improvements in later years to better facilitate stormwater removal and accommodate new developments (Consolidated Diking Improvement District #1 2013 cited in AECOM 2015).

No development is known to have occurred within the study area prior to the 1940s, except for the levees and diking improvements. In 1929, the Weyerhaeuser Timber Company built its sawmill on a 700-acre site east of the study area, between it and the Long-Bell Company mill. However, the study area itself remained primarily agricultural until the construction of the former Reynolds facility in the study area, beginning in the early 1940s.

In 1941, the Reynolds Metals Company established a new aluminum reduction plant on 400 acres of riverfront property west of the Long-Bell Lumber Company, acquired from the Long-Bell Lumber Company. The new facility benefited from rail and water transportation access, an abundance of wood for fuel and facility construction, and major hydroelectric power provided by BPA along the Columbia River (McClary 2008; Donovan and Associates 2013:2, both cited in AECOM 2015). The Reynolds Metal Company entered into a 20-year contract with BPA for 40,000 kilowatts of power to serve the facility (Bonneville Power Administration 1953:3 cited in AECOM 2015).

The Reynolds Metals Company completed construction of its Longview plant in November 1942. The plant was designed as a duplicate of the company's older aluminum plant in Listerhill, Alabama, and primarily consisted of those structures built in the South Plant area. The consulting engineer for the plant's construction was the J. E. Sirrine & Company of Granville, South Carolina and the builder was Austin & Company of Seattle, Washington. To prepare the property for construction of the new plant, the Reynolds Metals Company placed extensive amounts of fill behind the existing river levees to raise the property's elevation from between 5 and 10 feet to a level surface across the site (Bechtel Engineering 1968 cited in AECOM 2015).

The now-former Reynolds facility was one of five Pacific Northwest aluminum plants constructed before and during World War II. Aluminum was an important component of shipbuilding during World War II, and these plants supplied large quantities of the metal to the Kaiser Shipyards in Portland, Oregon, and Vancouver, Washington, in addition to many other wartime production facilities throughout the region (Oregon Blue Book 2014 cited in AECOM 2015). Four additional aluminum-reduction plants were built in the Pacific Northwest during the postwar period. Only two plants are still actively used for aluminum reduction today.

Following World War II, the aluminum industry grew rapidly in the 1950s and 1960s with the introduction of innovative new products and rising consumer demand. To accommodate this growth, the Reynolds Metals Company “modernized” its Longview plant. The company expanded its existing production lines in the South Plant in the early 1950s and further increased the plant’s capacity in the late 1960s by expanding and altering the existing plant and constructing additional facilities at the property’s western end. These improvements more than doubled the Longview plant’s production capacity by 1969, making it the third largest employer in Cowlitz County and one of the largest aluminum manufacturers in the Pacific Northwest (Weber, Denni, and Maxey 2012:84 cited in AECOM 2015).

Over the next 30 years, the aluminum industry gradually declined in the Pacific Northwest. The Reynolds Metals Company continued operations at its Longview plant until 2000, when it was purchased by Alcoa, Inc. as a wholly owned subsidiary. Alcoa operated the plant through 2001. Thereafter, the property was owned and operated by several companies and investment groups until it was fully decommissioned by Chinook Ventures, Inc. in 2005. The property is currently owned by Northwest Alloys who sold the plant’s assets to the Applicant in January 2011 (Donovan and Associates 2013:3 cited in AECOM 2015).

3.4.4.2 Archaeological Resources

This section describes the results of archaeological investigations within the study area, including previous and current archaeological surveys and geotechnical monitoring conducted for the Proposed Action.

Archaeological Surveys

No previously recorded archaeological sites are known to exist within or in the immediate vicinity of the study area. The pedestrian archaeological surveys conducted in January 2015 identified eight landscape features in the study area, which were newly documented as archaeological sites. These eight documented sites consist of three landfills, four fill deposits, and the area of the former South Plant. All eight sites were associated with the former Reynolds facility. Seven were determined to be 45 years of age or older. Of these, six were found to retain good integrity. These six sites were determined eligible for listing in the NRHP as contributing elements of a NRHP-eligible historic district encompassing the former Reynolds facility.

The South Plant area and one landfill were determined not eligible for listing in the NRHP. The landfill was found to be less than 45 years of age. The South Plant area consists of recently demolished resources that no longer retained sufficient integrity to convey historical significance. Demolition of the resources in the South Plant area had previously occurred as a separate, unrelated project.

Geotechnical Investigations

No precontact archaeological resources were identified as a result of the geotechnical investigations. Observations made during the investigations generally correlated with the results of previous geotechnical work in the study area. These studies indicated that much of the study area was likely a stable, low-lying wetland prior to the relatively recent filling and industrial development, and possibly had been in this condition for thousands of years. The results were also consistent with historical General Land Office and USGS maps showing past landforms in the study area.

Fill materials were found to extend across the study area in depths of about 5 to 10 feet on average, except in the portions of the study area farthest from the Columbia River, where fill depths may be 1 to 2 feet. Fill materials are overlying native alluvial sediments. Most or all of the alluvium observed during the geotechnical investigations was determined to be from the Holocene Epoch with no substantial soil development, reaching depths of up to 70 feet. The Holocene alluvium was interpreted to have accumulated in channel, near-channel, or floodplain environments that would have been perennially or seasonally saturated, such as in a low-lying wetland. This conclusion was substantiated by the characteristic features of the soils.

Five samples of organic debris and tephra recovered during the geotechnical investigations were submitted for chronological dating to better understand landform formation in the study area. The chronological dates of these samples helped establish the overall pattern of depth, character, and thickness of alluvial sediments within the study area.

No potential archaeological resources were identified in the proposed dredge prism for the Proposed Action based on historical data and recent in-water surveys. Dredging of the Columbia River began in the late 1800s and has continued up to the present (Grette and Associates and Coast Harbor Engineering 2015 cited in AECOM 2015). Below-water surveys conducted for the Northwest Alloys remedial investigation and feasibility study indicate that this section of the Columbia River is subjected to fast-moving currents. A recent below-water hydrogeographic survey did not indicate the presence of anomalies (e.g., shipwrecks, piers, or canoes) in the proposed dredge prism for the Proposed Action (David Evans and Associates 2009 cited in AECOM 2015). Near-surface submerged deposits may have been subjected to substantial historic to modern disturbance via erosion (Grette and Associates and Coast Harbor Engineering 2015 cited in AECOM 2015).

3.4.4.3 Historic Resources

The historic resources survey identified four built environment resources in the study area. These resources are the former Reynolds facility, the CDID #1 levee, the BPA Longview Substation, and the Reynolds Federal Credit Union. The Lewis and Clark National Historic Trail, which is a nationally significant trail that traverses the study area, was also considered.

Reynolds Metals Reduction Plant Historic District

The former Reynolds facility was evaluated as a historic district and documented on an NRHP nomination form as part of the concurrent Section 106 review undertaken by the Corps (Gratrek et al. 2015). Referred to as the Reynolds Metals Reduction Plant Historic District, the property was determined eligible for listing in the NRHP through this process as a historic district under NRHP Criteria A and C.³ Under Criterion A, the historic district's buildings and structures are associated with the aluminum industry's major growth periods during World War II and through the 1960s.

³ The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. That are associated with the lives of significant persons in our past; or
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. That have yielded or may be likely to yield, information important in history or prehistory.

Under Criterion C, the former Reynolds facility represents the aluminum industry's development in the Pacific Northwest and conveys its trend toward functional integration that occurred between World War II and the 1960s, which led to combining the reduction process with product manufacturing. The Reynolds Metals Reduction Plant Historic District consists of 53 separate resources, including 33 buildings, 12 structures, and eight landscape features (recorded as the aforementioned archaeological sites). Of these 53 identified resources, 39 were determined to contribute to the historic district's significance. Fourteen resources were determined to be noncontributing elements to the historic district because their construction postdates the historic district's period of significance or they have been heavily altered.

CDID #1 Levee and the BPA Longview Substation

The CDID #1 levee and the BPA Longview Substation were both determined to be contributors to the Reynolds Metals Reduction Plant Historic District and individually eligible for listing in the NRHP.

Lewis and Clark National Historic Trail

The portion of the Lewis and Clark National Historic Trail that traverses the study area is known as the Lower Columbia River Water Trail. No individual sites associated with the Lewis and Clark National Historic Trail were identified in the study area. The National Park Service is currently identifying high potential historic sites and high potential route segments along the trail; however, this list has not been released to the public (Gladstone 2014 cited in AECOM 2015). Because of the significant industrial development along on the north side of the Columbia River, it is unlikely that landscape features in or near the study area would contribute to the significance of the Lewis and Clark National Historic Trail.

Other Historic Resources

The Reynolds Federal Credit Union building was evaluated as not eligible for listing in the NRHP. Outside the study area, the nearest recorded historic property is the J.D. Tennant house, or Rutherglen Mansion, which is listed in the NRHP. This property is located approximately 0.5 mile north of the study area at the base of Mount Solo. Two cemeteries are also located on Mount Solo about 1.2 miles north of the study area: Longview Memorial Park Cemetery and Mount Solo Cemetery.

3.4.4.4 Culturally Significant Properties

No culturally significant properties were identified within the study area. Outside the study area, four ethnographic sites are known to exist within several miles of the study area close to the Columbia River: three Native American village locations and the site of Mount Coffin. The latter is significant to the Confederated Tribes of the Grand Ronde Community of Oregon and has been identified as a traditional cultural property eligible for listing in the NRHP. Although other areas of ethnographic significance may be located near the study area, they are not documented in the available literature.

3.4.4.5 Rail and Vessel Corridors in Washington State

While not part of the stated study area, this section considers presence of cultural resources along the rail and vessel transportation corridors associated with the Proposed Action in Washington State. These corridors extend beyond the study area considered by the Section 106 review process led by the Corps and were not included as part of that undertaking. WISAARD and the aforementioned information sources were used to identify previously recorded cultural resources outside the study area in the vicinity of the rail and vessel transportation corridors and to establish possible resource types in these areas.

Rail Transportation Corridor

Archaeological Resources

Several types of archaeological resources may occur along the rail transportation corridor. The precontact and ethnographic contexts of the Columbia River basin indicate that the river and its many tributaries were important for habitation and resource gathering, and as an inland travel corridor. Previously recorded archaeological sites and isolated finds are known to exist along the rail corridor, and there likely many more that have not been discovered. The types of precontact archaeological sites that might exist within the rail transportation corridor include village sites, camps, lithic scatters, cairns, rock alignments, house pits, petroglyphs, pictographs, shell middens, talus pits, burials, fishing stations, and trails. Historic-era archaeological sites are also present. The most common of these include historical agriculture, homestead, logging, and railroad-related properties.

The rail transportation corridor passes through seven known archaeological districts. The Plymouth District, Sk'in Village Cultural District, and Vancouver Lakes Archaeological District contain precontact and historic components. The Crow Butte Island District, Columbia Hills Archaeological District, Miller Island District, and Wishram Indian Village Site all contain precontact features and sites. The highest concentration of previously recorded archaeological resources along the Columbia River are situated near the Celilo Falls area at the confluence with the Deschutes River, The Dalles, and Portland Basin. The quantity and distribution of archaeological sites depends on the types of activities that occurred in the different geographic regions through which the rail transportation corridor passes and the level of archaeological inquiry that has occurred in these areas.

Historic Resources

Railroads were important to the development of Washington and several types of historic resources may occur along the Proposed Action's rail transportation corridor. These resources include previously recorded NRHP and WHR-eligible properties, as well as historically significant resources that have not yet been identified. Rail transportation has taken place along the banks of the Columbia River and contributed to the development of communities in this vicinity since the 1850s. As a result, historic resources are known to exist throughout this area with the highest concentration occurring in urbanized areas near Spokane and Vancouver. The types of historic resources typically found along the rail transportation corridor include railroad-related structures, single-family and multifamily residences, and commercial and industrial properties.

NRHP and WHR-eligible historic districts contain high concentrations of resources that are linked by their period of development and significance in American history. Several historic districts exist

along the rail transportation corridor. These districts includes the Millwood Historic District, West Downtown Historic District, and Riverside Avenue Historic District in Spokane, the Ritzville Historic District and Cheney Historic District in Ritzville and Cheney, respectively, and the Fort Vancouver National Historic District in Vancouver. The latter is also a designated National Historic Landmark.

Vessel Transportation Corridor

Archaeological Resources

Precontact peoples used the upland shorelines of the Columbia River and its tributaries for habitation, plant gathering, and hunting; and the river itself for fishing and resource harvesting. Previously recorded archaeological sites and isolated finds are known to exist along the vessel transportation corridor, and there are likely many more that have not been discovered. The types of precontact archaeological sites and culturally significant properties that might exist within the vessel transportation corridor are similar to those that might occur in the rail transportation corridor. The highest concentration of previously recorded archaeological resources occurs near the Columbia River mouth. However, the quantity and distribution of archaeological sites depends on the types of activities that occurred in the different geographic regions through which the vessel transportation corridor passes and the level of archaeological inquiry that has occurred in these areas.

Historic Resources

The vessel transportation corridor contains concentrations of historic resources. The types of historic resources in these areas are similar to those found along the rail transportation corridor.

3.4.5 Impacts

This section describes the potential direct and indirect impacts related to cultural resources that would result from construction and operation of the Proposed Action and the No-Action Alternative.

3.4.5.1 Proposed Action

This section describes the potential impacts that could occur in the study area as a result of construction and operation of the Proposed Action.

Construction—Direct Impacts

Construction-related activities associated with the Proposed Action could result in direct impacts as described below. As explained in Chapter 2, *Project Objectives, Proposed Action, and Alternatives*, construction-related activities include demolishing existing structures and preparing the site, constructing the rail loop and dock, and constructing supporting infrastructure (i.e., conveyors and transfer towers).

Construction of the Proposed Action would occur adjacent to the current shoreline and include dredging and in-water construction of two docks in the Columbia River. This work would demolish 30 of the 39 identified resources in the study area that contribute to the historical significance of the Reynolds Metals Reduction Plant Historic District. The Proposed Action would adversely affect cultural resources through the demolition of buildings and structures that contribute to the Reynolds Metals Reduction Plant Historic District. The anticipated adverse impacts on these

resources would diminish the integrity of design, setting, materials, workmanship, feeling, and association that make the historic district eligible for listing in the NRHP. If the Proposed Action is constructed, the Reynolds Metals Reduction Plant Historic District would no longer be eligible for listing in the NRHP.

The demolition of buildings and structures associated with the former Reynolds facility could affect the CDID #1 levee and the BPA Longview Substation. Both resources have been determined eligible for listing in the NRHP individually and as contributing elements of the Reynolds Metals Reduction Plant Historic District. The resources' integrity of setting and association would be diminished by the demolition of buildings and structures that contribute to the Reynolds Metals Reduction Plant Historic District, because the historic district would no longer be eligible for listing in the NRHP. Despite these impacts, the CDID #1 and BPA Longview Substation would remain individually eligible for listing in the NRHP.

The J. D. Tennant House is located on a terrace of Mount Solo about 0.5 mile north of the study area. This property is listed in the NRHP. The J. D. Tennant House, however, was oriented to face the former Long-Bell Lumber Mill (now Weyerhaeuser property), and is most closely associated with the lumber mill. The former Reynolds facility did not exist when the house was constructed. Although the J. D. Tennant House may have a view of the southeast corner of the project area, no adverse impacts are anticipated.

The Proposed Action would also involve the extension of dock supports and/or conveyors over the CDID #1 levee and the construction of support structure on either side of the resource. Impacts from these activities are expected to be minimal and would not diminish the levee's integrity as a flood control structure. Construction activities near the BPA Longview Substation would not affect its physical integrity and it would remain functional.

Because the upland areas of the project area landward of the levee consist largely of fill material that deeply covers a historic low-lying wetland, there is limited potential to encounter undocumented archaeological sites. However, as described in Chapter 2, *Project Objectives, Proposed Action, and Alternatives*, construction of the Proposed Action would require surface grading, compaction to a depth of approximately 25 feet, and pile driving to a depth of approximately 70 feet. Based on the results of the geotechnical investigations conducted in and near the project area, archaeological resources could exist in native soil below the existing fill. Geotechnical investigations indicated that the depths of fill in the study area typically range from 5 to 10 feet on average below the existing surface. The only impacts expected to extend below this depth are the compaction/displacement impacts and installation of deep piles associated with the coal stockpiling development area; neither activity would yield sediment for observation.

An Inadvertent Discovery Plan would address the discovery of any previously unidentified archaeological resources during construction.⁴

Construction—Indirect Impacts

Construction of the Proposed Action would not result in any indirect impacts on cultural resources because construction would be limited to the project area.

⁴ An Inadvertent Discovery Plan (also referred to as an Unanticipated Discovery Plan) outlines procedures to be followed if previously unknown archaeological or historical resources are discovered during project activities.

Operations—Direct Impacts

Operation of the Proposed Action would result in the following direct impacts. Operations-related activities are described in Chapter 2, *Project Objectives, Proposed Action, and Alternatives*.

Routine operation and maintenance of the coal export terminal are not expected to affect cultural resources in the study area. Remaining portions of the Reynolds Metals Reduction Plant Historic District would no longer be eligible for listing in the NRHP, due to a loss of integrity caused by the removal. The CDID #1 levee and BPA Longview Substation, meanwhile, would remain individually eligible for listing in the NRHP.

Archaeological resources in the project area discovered during construction could be vulnerable to inadvertent disturbance during routine operations and maintenance. If previously undocumented archaeological resources are encountered in the project area during routine operations, they would be addressed through implementation of an Inadvertent Discovery Plan.

Increased vessel transport could also affect the Lewis and Clark National Historic Trail. However, due to the industrial development near the study area, these impacts are anticipated to be minimal. The portion of the trail in the study area does not retain historic integrity. The features present during the Lewis and Clark expedition have been significantly modified by existing industrial development.

Operations—Indirect Impacts

Operation of the Proposed Action would not result in any indirect impacts on cultural resources in the study area.

Outside the study area within the rail and vessel transportation corridors, impacts on cultural resources were assessed qualitatively based on an expectation of the types of resources likely to be present and an assessment of how they could be affected by routine operations. Impacts were determined by evaluating if operations would alter any characteristic of a cultural resource (archaeological, historical, or culturally significant) that qualifies the resource for inclusion in the NRHP or WHR, or affect a recorded archaeological site.

Rail Transportation Corridor

Archaeological Resources

An increase in the duration of noise and visual interruptions from trains associated with the Proposed Action could impact the setting of archaeological resources along the rail transportation corridor. Increased dirt and dust from passing trains could affect the setting of these resources. These resources are currently subjected to existing rail traffic along existing rail lines.

Rail transport of coal under the Proposed Action would occur along existing railroad lines along the rail transportation corridor. Increased rail traffic along these railroad lines under the Proposed Action could affect resources located nearby as a result of visual and audible intrusions or vibrations. The setting of archaeological resources along the rail transportation corridor could be impacted.

As discussed in Chapter 5, Section 5.5, *Noise and Vibration*, the Proposed Action would result in noise impacts due to train's sounding their horns. However, increased noise from locomotive or car

traffic alone (without horn sounding) would not result in noise impacts that would adversely affect cultural resources. Moreover, if resources along the line contain prominent and distinctive character-defining visual features, the alteration of the views from increased traffic would not affect these resources to the extent that they would no longer be considered historically significant (Section 3.3, *Aesthetics, Light, and Glare*). Therefore, impacts on archaeological resources as a result of routine rail transport under the Proposed Action are not considered significant.

Historic Resources

Similar to archaeological resources, historic resources could be impacted by increased rail traffic under the Proposed Action along the rail transportation corridor. Visual and audible intrusions or vibrations could affect resources located in the vicinity of the railroad lines. These impacts would be the same as those described above for archaeological resources. In addition, some historic resources along the rail transportation corridor, such as bridges, tunnels, and other features, associated with the existing rail system, could be impacted by increased usage that would degrade these rail facilities, necessitating more frequent repairs and limitations on use during repairs. Physical access to some historic resources could also be obstructed as a result of increased gate closures due to passing trains associated with the Proposed Action.

Vessel Transportation Corridor

Archaeological Resources

Vessel transport would occur within the existing navigation channel on the Columbia River. Increased vessel traffic under the Proposed Action could result in an incremental increase in shoreline erosion. The shoreline analysis concluded that impacts on archaeological sites along the lower Columbia River were not likely to result from an increase in Proposed Action-related vessel traffic because individual site conditions would inhibit, reduce, and or minimize vessel wake energy, thus minimizing the potential for measurable erosion from vessel wakes (McDaniel et al. 2015:88 cited in AECOM 2015).

Historic Resources

Visual and audible intrusions or vibrations could affect historic resources located in the vicinity of the vessel transportation corridor. These impacts would be the similar to those described above for the rail transportation corridor. Impacts on historic resources along the vessel corridor could include more frequent noise from increases in the number of vessels passing such resources. Historic resources along the vessel transportation corridor are subject to existing vessel traffic.

3.4.5.2 No-Action Alternative

Under the No Action Alternative, the Applicant would not construct the coal export terminal and impacts on cultural resources related to construction and operation of the Proposed Action would not occur. The Applicant would continue with current and future increased operations in the project area. The project area could be developed for other industrial uses, including an expanded bulk product terminal or other industrial uses. The Applicant has indicated that, over the long term, it would expand the existing bulk product terminal and develop new facilities to handle more products such as calcine petroleum coke, coal tar pitch, and cement.

This new industrial development would be subject to environmental review under SEPA and/or NEPA and substantive regulatory approvals, including building demolition, and/or expanded industrial operations and the construction of upland facilities related to such potential operations. Such development could result in impacts similar to those described above for the Proposed Action.

3.4.6 Required Permits

Federal permits would be required from the Corps for what the Corps has defined as the Proposed Action. A decision by the Corps on whether to issue or deny a Department of the Army permit would be considered a federal undertaking subject to the requirements of NEPA and Section 106 of the NHPA. In compliance with Section 106 of the NHPA, the Corps has initiated consultation as described in Section 3.4.3.3, *Agency and Tribal Consultation*.

Based on the outcome of the Section 106 consultation process, the Applicant would be required to comply with the provisions of the Memorandum of Agreement to resolve adverse effects of the Proposed Action.

An Inadvertent Discovery Plan would be required to address any discovery of previously unidentified archaeological resources during construction. The Applicant would submit the plan to DAHP for review and would not begin construction until approval of the plan. The Inadvertent Discovery Plan would require work to immediately stop in the vicinity of a discovery and would require the Corps, Cowlitz County, DAHP, and potentially affected Native American tribes be notified. If archaeological resources are discovered, construction could be halted in the area until the Corps, in consultation with DAHP and tribes, determines the appropriate course of action.

3.4.7 Proposed Mitigation Measures

This section describes the proposed mitigation measures that would reduce impacts related to cultural resources from construction and operation of the Proposed Action. These mitigation measures would be implemented in addition to project design measures, best management practices, and environmental compliance that are assumed as part of the Proposed Action.

3.4.7.1 Applicant Mitigation

The Applicant would implement the following measure to mitigate impacts on cultural resources.

MM CR-1. Monitor Ground-Disturbing Activities

To protect archaeological resources that may occur in subsurface deposits, the Applicant will have a qualified professional archaeologist monitor ground-disturbing activities. If archaeological resources are discovered, construction could be halted in the area until the Corps, in consultation with DAHP and tribes, determines the appropriate course of action.

3.4.8 Unavoidable and Significant Adverse Environmental Impacts

Demolition of the Reynolds Metals Reduction Plant Historic District is an unavoidable and significant adverse environmental impact. The Memorandum of Agreement is currently being negotiated among the Corps, Cowlitz County, DAHP, City of Longview, BPA, National Park Service, potentially affected Native American tribes, and the Applicant. The Memorandum of Agreement may resolve this impact in compliance with Section 106 of the NHPA.